# Appendix C.
# Changes: 2019 to 2021

The American Housing Survey (AHS) began in 1973 as the Annual Housing Survey. Since 1981, the U.S. Census Bureau has conducted the national survey every odd numbered year. In 1984, it was renamed the American Housing Survey. Beginning with the 2011 AHS, the survey instrument consisted of a permanent set of core questions, plus questions on topical supplements that will rotate in and out of future surveys. Starting in 2013, the AHS asked questions from the topical supplements of only half the sample to reduce respondent burden. In 2015, the AHS underwent a major redesign whereby a new national and metropolitan area longitudinal sample was selected for the first time since 1985.

Results from the 2021 AHS will be available in the following two formats:

- AHS Table Creator (a web application)
- Public Use File (PUF) (microdata)

Using the Table Creator tool, AHS summary tables can be customized using selected column variables and tenure and geography filters, then downloaded into Excel.

This document only notes changes in Table Creator column variables (box heads), tables, and table items (individual table rows/stubs) for the 2021 survey year. For historical changes prior to 2021, see http://www.census.gov/programs-surveys/ahs/tech-documentation/def-errors-changes.html. For information about changes to individual variables on the Public Use File, see the Codebook at https://www.census.gov/programs-surveys/ahs/tech-documentation/codebooks.html.

## Rounding:

Beginning in 2015, all medians, except Year Structure Built, and means starting in 2019 have been rounded to four significant digits as part of the new disclosure avoidance protocol.

## Dependency:

"Dependent interviewing" is the practice of using a respondent's answer to a question from a *prior* survey to "fill in" the response to the same question in the *current* survey, thereby improving accuracy and reducing respondent burden in the current survey. For changes in dependent interviewing between 2019 and 2021, see https://www.census.gov/programs-surveys/ahs/tech-documentation/help-guides/2015-later/Dependent_Interviewing18.html.

## Modified Column Variables:

**Year Structure Built.** The YRBUILT variable has a high percentage of cases that are imputed with administrative records. For more information, see Imputing Year Built With Property Tax Data.

**Occupancy/Vacancy Status.** In 2021, HUD made questionnaire changes that reduced the item non-response rate for the Vacant Status variable (VACANCY).

**Monthly Total Housing Costs.** A new imputation method impacted this variable. For more information, see Mortgages Currently on Property (MORTSTAT), under the Mortgage Characteristics section.

## New Tables:

The 2021 AHS included new topical supplements. As a result, four new tables were introduced:

**Delinquent Payments and Notices.** Table covers topics such as utility payment activity, as well as foreclosures and eviction notices. While all the table stubs previously appeared in the 2017 AHS, a few changes were made that impacted the universe of the 'Mortgage Payment Activity in Last Three Months' and 'Foreclosure Status' stubs in 2021. For more information, see Mortgages Currently on Property (MORTSTAT), under the Mortgage Characteristics section.

**National Wildfire Risk.** Climate change and residential expansion have increased the potential for wildfires that affect residential areas. The National Fire Protection Association® (NFPA®) approached HUD with an interest in analyzing the characteristics of housing that increase wildfire vulnerability. The focus of this module is to understand the extent to which these characteristics exist in the relevant housing stock. Wildfire questions in the AHS were designed to assess the building materials used on certain parts of the home and determine if any hazards exist around the home that could make it more likely to sustain severe damage during a wildfire. The National Wildfire Risk table is limited to

respondents who live in a Wildland-Urban Interface (WUI), defined by the U.S. Forest Service as an area where homes and other structures are in or adjacent to undeveloped wildland vegetation prone to large scale wildfire, thereby posing a significant threat to human life or property. Since this table uses the WUI geography, it was not approved for the Public Use File for disclosure avoidance purposes. As a result, this table is only available at the National and Census Division level.

**Wildfire Risk in Selected Census Divisions.** This table is an extension of the National Wildfire Risk table, but because it does not use the WUI variable, it does not have the same disclosure risk. This table is instead limited to respondents who live in at-risk Divisions, which are defined by HUD with input from the National Fire Protection Association® (NFPA®). They include the following Census Divisions: South Atlantic, West South Central, Mountain, and Pacific. As a result, this table is available for states and metros that are located within those four divisions, except Maryland and Virginia.

**Household Pets.** Pets last appeared in the 2017 AHS as part of the Disaster Planning table where the focus was on whether households needed assistance evacuating or sheltering their pets during an emergency. Pet questions in 2021 are slightly more detailed, as adopted from the General Social Survey (GSS). Pets questions in the AHS ask if the household has any pets, including foster pets, but excluding service animals and livestock (i.e., cows, horses, pigs). Questions ask about the presence of dogs, cats, small mammals (i.e., rabbits, gerbils, hamsters), fish, birds, and reptiles (i.e., turtles, snakes, lizards).

## Deleted Tables:

All the 2019 topical supplements were dropped from the 2021 AHS but may return in subsequent surveys. As a result, the following tables are not options in the 2021 Table Creator menus:

**Home Accessibility.**

**Food Security.**

**Post-Secondary Education.**

## Table Changes: (listed by table title and universe)

**Housing Unit Characteristics** (All Housing Units)

### Modified Items:

In 2021, HUD made questionnaire changes aimed at reducing the item non-response rate for the Vacant Status variable (VACANCY). The following stubs may have been impacted:

- *Suitability for Year-Round Use*
- *Homes Currently for Sale or Rent*
- *Reason Extra Unit Owned*

*Lot Size*. This variable has a high percentage of cases that are imputed with administrative records. For more information, see Imputing Lot Size with Property Tax Data.

*Year Structure Built.* The YRBUILT variable has a high percentage of cases that are imputed with administrative records. For more information, see Imputing Year Built With Property Tax Data.

**General Housing** (Occupied Units)

### Modified Items:

*Year Structure Built.* This variable has a high percentage of cases that are imputed with administrative records. For more information, see Imputing Year Built With Property Tax Data.

**Rooms, Size, and Amenities** (Occupied Units)

### Modified Items:

*Lot Size*. This variable has a high percentage of cases that are imputed with administrative records. For more information, see Imputing Lot Size with Property Tax Data.

**Income Characteristics** (Occupied Units)

### Modified Items:

*Income of Families and Primary Individuals.* The missing rate for the 'Farm income' row decreased from 2019 because many of the cases that were not asked the question during the interview (due to the lot size restrictions) were edited into the universe after receiving lot size values from administrative records.

**Housing Costs** (Occupied Units)

### Modified Items:

*Monthly Total Housing Costs.* A new imputation impacted this variable. For more

information, see Mortgages Currently on Property (MORTSTAT), under the Mortgage Characteristics section.

*Monthly Cost Paid for Rent.* Census updated the RENT variable's imputation formula to better reflect rental market conditions in 2021. This, in combination with economic factors, caused the average of the RENT variable to increase. For more information, see Item Nonresponse and Imputation: 2015 and Beyond.

*Monthly Cost Paid for Real Estate Taxes.* The variable PROTAXAMT uses the newly updated current market value of the unit (MARKETVAL) imputation to fill in missing values, as well as updated state property tax rates.

*Monthly Cost Paid for Utilities and Monthly Cost Paid for Gas.* In 2021, Census updated the Utility Estimation models using the Energy Information Administration's 2015 Residential Energy Consumption Survey (RECS), the most recently available data at the time of development. The following table highlights the differences in the data and methodologies across both modeled years. Additionally, Census made modifications to bring the RECS and AHS distributions closer to each other.

| Item | 2009 RECS | 2015 RECS |
|------|-----------|-----------|
| Sample size | 12,083 | 5,686 |
| Geographic level | Reportable Domain (groups of states) | Division |
| Modeling process | Separate geographical models | One model with geographic covariates |
| Outlier removal? | Yes | No |
| Degree Days | 1980 - 2010 30-year normals | 1990 - 2020 30-year normals |
| Propane transformation | Ln(gallonlp +1) | Gallonlp^0.25 |

**Value and Purchase Price** (Owner-Occupied Units)

**Modified Items:**

*Value.* Census updated the MARKETVAL variable's imputation formula to better reflect home values in 2021. This, in combination with economic factors, caused the average of the MARKETVAL variable to increase. For more information, see Item Nonresponse and Imputation: 2015 and Beyond.

*Year Unit Acquired.* Census introduced dependent interviewing to the YEARBUY variable, resulting in a lower missing rate in 2021. For more information, see Dependent Interviewing: 2015 and Beyond.

*Purchase Price.* Census introduced dependent interviewing to the PRICE variable, resulting in a lower missing rate in 2021. For more information, see Dependent Interviewing: 2015 and Beyond.

*Down Payment.* Census added an edit that used down payment information from the 2019 survey where possible to fix a problem where many 2021 respondents who had bought their home outright (100% down payment) mistakenly reported that they had "no down payment". However, Census did not use prior year answers for the rotating metros that were last in sample in 2017. Therefore the "no down payment" category may be overreported, while the "bought outright" category may be underreported within those geographies.

**Mortgage Characteristics** (Owner-Occupied Units)

The Mortgage section of the questionnaire was redesigned in 2021 to reduce respondent burden. As a result, several variables were deleted, others were added, and some imputations and edits changed. The 2019 Mortgage Characteristics table and the 2019 Additional Mortgage Characteristics table were combined into one 2021 table called Mortgage Characteristics.

**Modified Items:**

*Term of Mortgage.* There was a large drop in "33 years of more" and "Variable" rows between 2019 and 2021 for two reasons:

(1) MORTTERM edits were modified to prevent loan lengths from being unnecessarily extended.

(2) In 2021 Census made data quality improvements to increase accuracy in identifying when to ask or skip the mortgage questions. In past cycles, respondents who were incorrectly asked mortgage questions may have gravitated towards these categories.

A new imputation also impacted this variable. For more information, see Mortgages Currently on Property (MORTSTAT).

*Interest Rate of Mortgage.* A new imputation impacted this variable. For more information, see Mortgages Currently on Property (MORTSTAT).

*Year Mortgage Obtained.* There was a large drop in '1984 or earlier' for two reasons:

(1)  We expect loans obtained 30+ years ago to fall off sharply as they are paid off.
(2)  See part 1 of Term of Mortgage (MORTTERM) for edit modifications.

A new imputation also impacted this variable. For more information, see Mortgages Currently on Property (MORTSTAT).

*Total Outstanding Principal Amount.* There was a large drop in the "Less than $20,000" row. In addition to economic factors that may have caused this, some processing changes occurred that contributed to this drop:

(1) Starting in 2021 the minimum for UNPBALAMT increased to $4. This change did not significantly impact the median.

(2) In 2021 Census made data quality improvements to increase accuracy in identifying when to ask or skip the mortgage questions. Owned free and clear units mistakenly asked the mortgage questions in past cycles tended to give the smallest allowable value for the remaining unpaid loan balance. Skipping the mortgage questions for units owned outright would likely reduce the number of very small, reported balances.

A new imputation also impacted this variable. For more information, see Mortgages Currently on Property (MORTSTAT).

*Mortgage Payment Amount.* There was a large drop in low-end categories (less than $500, $500-$749, $750-$999). PMTAMT reflects any payments included in the loan payment, including principal, interest, property taxes, homeowner's insurance, etc. In past cycles some loan payments amounts were too small for one of two reasons.

(1) PMTAMT was allowed to be smaller than the property tax and / or homeowner's insurance payments contained within it.

(2) Missing payment amounts were filled in with a principal-and-interest-only estimate, even if the respondent indicated that the payment also included property tax and / or homeowner's insurance.

In 2021 both issues were addressed, increasing payment amounts. The median has increased as well, compared to earlier years. A new imputation also impacted this variable. For more information, see Mortgages Currently on Property (MORTSTAT).

*Items Included in Mortgage Payment.* In 2021 the private mortgage insurance variable (PMIPMT), the property insurance variable (INSPMT), and the property tax variable (TAXPMT) were collected differently (previously INSPMT and TAXPMT were asked separately for each loan; in 2021 one question covered all loans). A new imputation also impacted this variable. For more information, see Mortgages Currently on Property (MORTSTAT).

*Primary Mortgage Refinance Status*. A new imputation impacted this variable. For more information, see Mortgages Currently on Property (MORTSTAT).

*Type of Mortgage*.
*Cash Received in Primary Mortgage Refinance.* There was an increase in "refinanced to receive cash," due to market conditions as well as a modification to the questionnaire where the answer categories changed from a list to asking 'refinanced to receive cash' as a standalone question.

*Mortgages Currently on Property.* In 2021, Census introduced an imputation for the MORTSTAT variable that assigned a mortgage status to owner-occupied units that did not report whether they were mortgaged or owned free and clear. In prior waves, these units defaulted to MORTSTAT = 1 (no mortgage). This impacted the following stubs/variables:

- Households With At Least One Mortgage (MORTLINE)
- Type of Federal Government Mortgage Insurance (MORTGOV)

- Primary Mortgage Refinance Status (REFI)
- Frequency of Mortgage Payment (PMTFREQ)
- Items Included in Mortgage Payment (INSPMT, PMIPMT, TAXPMT)
- Total Outstanding Principal Amount (UNPBALAMT)
- Interest Rate of Mortgage (INTRATE)
- Term of Mortgage (MORTTERM)
- Initial Amount Borrowed or Refinanced (AMMORT)
- Year Mortgage Obtained (MORTYEAR)
- Mortgage Payment Amount (PMTAMT)
- Amount of mortgage payment paid towards principal and interest only (PMTONLY – does not appear in tables)
- Monthly Total Housing Costs (TOTHCAMT)
- Mortgage Payment Activity in Last Three Months (DBMISSMORT)
- Foreclosure Status (DBMORTFORC, DBINFORC, DBLVEFORC, DBFORCWHR)

In addition, the "reverse mortgage only" row increased in 2021, due in part to the following redesign changes that led to more reported Reverse Annuity Mortgages (RAMs):

(1) In 2021 the universe expanded so that all units with at least one owner 62+ are asked about RAMs instead of only asking the RAM question of units where all owners were 62+.

(2) Previously RAM was only asked if the respondent reported zero, "Don't know," or "Refused" when asked about the number of mortgages on the property. In 2021 RAM is asked prior to the number of mortgages question and is no longer dependent on its answer.

*Total Home-Equity Line-of-Credit Limit.* The minimum value for HELOCLIM increased in 2021 to $4, which significantly impacted the mean, but kept the median relatively stable.

*Home-Equity Line-of-Credit Has a Current Balance.* Previously the calculation was reset for each loan, causing some units to be assigned a missing value incorrectly. The variable now correctly summarizes the information across up to three loans.

Changes in the questionnaire (question order) also impacted processing for HELOCBAL. In previous cycles HELOCBAL was asked *after* questions about the payment amount and unpaid balance amount, which resulted in contradictory survey responses that required HELOCBAL to be heavily edited. In 2021 HELOCBAL was asked *before* questions about payment amount and unpaid balance amount. In addition, payment and balance questions were skipped altogether if the respondent reported that the line-of-credit did not currently have a balance. As a result, respondents were not able to report contradictory answers, which required HELOCBAL to be only lightly edited in 2021.

**Neighborhoods** (Occupied Units)

### Modified Items:

*Secured Communities.* The variable GATED used dependent interviewing where prior year data is used to verify the current year response. In 2017 and 2019, an error occurred and a number of cases were mistakenly not asked the GATED question. This error was corrected in 2021, resulting in an increase in gated communities and a corresponding decrease in missings.

## Table Layout Changes:
For information about changes to Summary Table presentation (i.e., new, deleted, and collapsed rows; suppression changes), see Table Creator Release Notes for September 29, 2022.

## New Metro Areas:
(Metros in the 2021 AHS Sample, but not in 2019)
Minneapolis-St. Paul
Tampa-St. Petersburg
Baltimore
San Antonio
Las Vegas
San Jose
Oklahoma City
Richmond
Birmingham-Hoover
Rochester
Metros sampled in 2021 match Office of Management and Budget (OMB) February 2013 delineations. All the above metros were last sampled in the 2017 AHS. For more on the definitions, see

[Metropolitan Area Histories](#) and
[https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html](https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html).


## **Deleted Metro Areas:**
(2019 Metro Areas not in 2021 AHS Sample)
Cincinnati
Cleveland
Denver
Kansas City
Memphis
Milwaukee
New Orleans
Pittsburgh
Portland
Raleigh


## **New States:**
(States in the 2021 AHS Sample, but not in 2019)
Maryland
Virginia


## **Deleted States:**
(2019 States not in 2021 AHS Sample)
Colorado
Ohio